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a bird of fire



KIRTLAND'S WARBLER

HURON NATIONAL FOREST, FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH U.S. FISH & WILDLIFE SERVICE AND MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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HURON NATIONAL FOREST
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U.S. FISH & WILDLIFE SERVICE



MICHIGAN DEPARTMENT
OF NATURAL RESOURCES



The Kirtland's warbler is one of the more rare, if not the most rare member of the wood warbler (Parulidae) family. Even though it is a bird of unusual interest from many facets, this yellow-breasted songster's fame among ornithological circles and elsewhere is largely due to its rarity. It has been said, "Ounce for ounce, the Kirtland's warbler has drawn more official interest and created more controversy than any other songbird in history."

Owing to its restricted range and its exacting habitat requirements, this warbler has probably always been a rare species. It was not until 1851 that it was discovered and described by scientists as a species. A male was taken on May 13, 1851 near Kirtland's farm on the outskirts of Cleveland, Ohio, and sent to the Smithsonian Institution in Washington. The species was named in honor of Dr. Jared P. Kirtland, physician, teacher, horticulturist and naturalist who authored first lists of birds, mammals, fishes, reptiles, and amphibians of Ohio.

The winter range of the Kirtland's warbler was found when a specimen was collected on Andros Island on January 9, 1879. All other wintering Kirtland's warblers that have been found were on Andros or others of the Bahama Islands.

It was not until July of 1903 that the nesting grounds were found in northern Lower Michigan. Norman A. Wood searched for and found the first nest to be discovered. It was located in Oscoda County about one half mile east of the Crawford County line and a mile north of the AuSable River. Every nest that has been found since has been within 60 miles of this spot.

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CATALOGING = PREP.



habitat



One of the characteristics of the Kirtland's warbler that has added to the interest in this bird is its very restrictive habitat requirements. This warbler nests only in young jack pine stands which are usually over 80 acres in size. Such habitat is known to have been present in the conifer zone on the sandy outwash plains in the wake of the Wisconsin Ice Sheet. This conifer zone was a comparatively narrow strip across the North Central States, and the amount of this specific habitat suitable to the warbler at any one time was probably small.

The stands are characterized by having dense clumps of trees and are interspersed with numerous small, grassy openings. The birds nest on the ground in

the openings or under the branches of the small trees. The birds will begin nesting in such stands when the trees are 5 feet high, or about 8 years of age, and continue use until the lower branches of the trees start dropping off. This occurs about the time the trees reach a height of 16 to 20 feet, or about 20 years of age. On the average, a breeding pair of warblers require about 30 acres of this habitat type for their nesting territory, although as little as 8-10 acres may suffice under optimal conditions.

Under natural conditions, the type of young jack pine stands that provide Kirtland's warbler nesting habitat are produced by fire. There are some instances where these birds used red or jack pine



plantations. However, in most of these cases, the warblers invaded such stands from adjacent "fire produced" habitat.

Another important, but not fully understood, aspect of Kirtland's warbler habitat is the type of soil upon which the nesting habitat occurs. It appears that all of the stands where the warbler nests occur on Grayling Sand. This is an extremely well drained sand soil with a low humus and nutrient content. The significance of this soil to the Kirtland's warbler is that it produces the plant community required for nesting habitat, and that water percolates through this soil so fast that nests are seldom flooded during a rain storm.

Fire has always occurred in the forest. It is because of this that jack pine and the Kirtland's warbler exist today. Heat from fire is needed to open jack pine cones to release the seed. Fire also prepares the ground for the germination of that seed.

Fires in pre-historic days were undoubtedly fewer, but were more extensive. They produced the jack pine "plains" that the lumbermen found as they moved across Lower Michigan in the last century. Logging and burning increased the area of jack pine, making more nesting habitat available to the Kirtland's warbler

at the turn of the century than at any other time. Observations indicate that the Kirtland's warbler was at a peak between 1890 and 1910.

Fire protection is a necessity in forest land management. However, with the advent of fire protection and other forest management practices, there has been a drastic decline of available warbler nesting habitat. Kirtland's warbler numbers in the past few decades have been but a fraction of their peak population.

Recognizing that modern forest management does not provide for this declining species, the Forest Service and Michigan Department of Natural Resources between 1957 and 1962 designated four areas within State and National Forests to be managed to produce Kirtland's warbler nesting habitat. Stands of jack pine have been cut and fire has been used to regenerate new stands for nesting habitat. Young jack pine stands have also been created by planting large open areas.

The value of these four areas can be seen by the fact that 53% of the nesting population occurred on these areas in 1973. It is clear that if this species is to be maintained at a nonendangered level, more of the jack pine stands that occur on the dry sand plains of northern Michigan will have to be managed similarly to produce nesting habitat in greater abundance. Some 130,000 acres of jack pine stands have been identified within 23 areas of State and National Forests that have potential for producing Kirtland's warbler nesting habitat. These stands are to be managed on a rotational basis so as to provide 36-40,000 acres of productive nesting habitat at all times. By carrying these stands to a 50 year rotational age, nesting habitat can be maintained for the warblers with little sacrifice to the commercial harvest of jack pine.



Because of the Kirtland's warbler's restricted range and specific habitat requirements it is feasible to census the entire nesting population by counting singing males. Being almost 100% monogamous, the total population can be estimated by doubling the male counts.

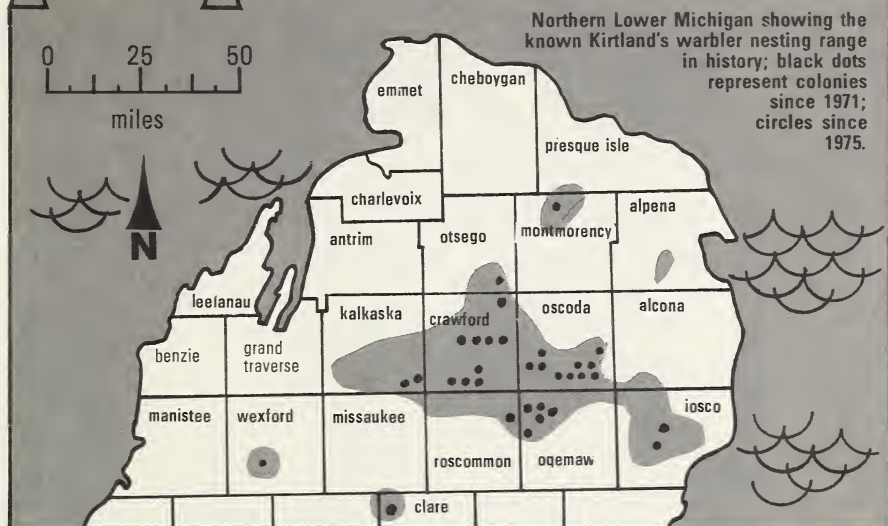
Censuses have been made in 1951, 1961, and annually since 1971. In recent years these counts have been expanded

to include other dry site jack pine areas in the Great Lakes Region. In 1978, unmated males were found in Renfrew Co., Ontario; Gatineau Co., Quebec; and Jackson Co., Wisconsin. In 1979, only a single unmated male was found outside of Michigan, again in Jackson Co., Wisconsin. The table below shows the singing males counted in Michigan and the known total for North America.

KIRTLAND'S WARBLER CENSUS — SINGING MALE COUNT

County	1951	1961	1971	1973	1974	1975	1976	1978	1979
Alcona	4	0	0	0	0	0	0	0	0
Crawford	142	52	101	114	88	90	95	74	75
Iosco	74	30	1	0	0	0	0	2	1
Kalkaska	28	32	0	0	0	3	7	16	21
Montmorency	43	61	1	0	0	0	0	0	0
Ogemaw	0	114	47	51	35	46	51	40	40
Oscoda	103	152	48	47	41	35	44	62	71
Otsego	0	14	3	0	0	0	0	0	0
Presque Isle	34	34	0	0	0	0	0	0	0
Roscommon	4	13	0	0	1	4	2	2	2
Wexford	0	0	0	4	2	1	1	0	0
Michigan Totals	432	502	201	216	167	179	200	196	210
North American Totals	432	502	201	216	167	179	200	200	211

populations



The Kirtland's warbler, its nests and eggs are given complete protection under Federal law by authority of The Migratory Bird Treaty Act of 1918 and the Endangered Species Act of 1973. Under Michigan law, protection is given by authority of The Game Law of 1929.

laws & regulations

Further, by order of the Director of the Michigan DNR; and by order of the Huron National Forest Supervisor under the Secretary of Agriculture's Regulations, KIRTLAND'S WARBLER NESTING AREAS IN THE STATE AND NATIONAL FORESTS ARE CLOSED TO PUBLIC ENTRY BETWEEN MAY 1 & AUGUST 15, except by tours authorized by the U.S. Fish and Wildlife Service. Free guided tours are run from mid-May to mid-July. The best period for seeing warblers is during late May and June. No reservations are necessary for individuals or small groups. REMEMBER, the disturbance of plants, birds, nests, and the PHOTOGRAPHY OF NESTS ARE STRICTLY PROHIBITED!

TOURS ORIGINATE AT THE FOLLOWING PLACES: (Contact these offices for times, dates, reservations for large groups, and other details)

Forest Service Ranger Station, Mio, MI 48647 (517-826-3717)
Michigan DNR Field Office, Grayling, MI 49738 (517-348-6371)

ANSWERS TO SPECIFIC QUESTIONS ABOUT THE KIRTLAND'S WARBLER MAY ALSO BE OBTAINED FROM: **U.S. Fish & Wildlife Service, 202 Manly Miles Bldg. 1405 S. Harrison Rd., East Lansing, MI 48823 (517) 372-1910**

the cowbird



Daw Chemical Co.

The Brown-headed cowbird, over many years in the distant past, developed the unusual behavior of laying its eggs in the nests of other species of birds. This leaves the host birds with the chore of hatching the cowbird eggs and rearing their young. Through the evolutionary process, the cowbird has lost all nest tending behavioral traits and has become a nesting parasite on many species.

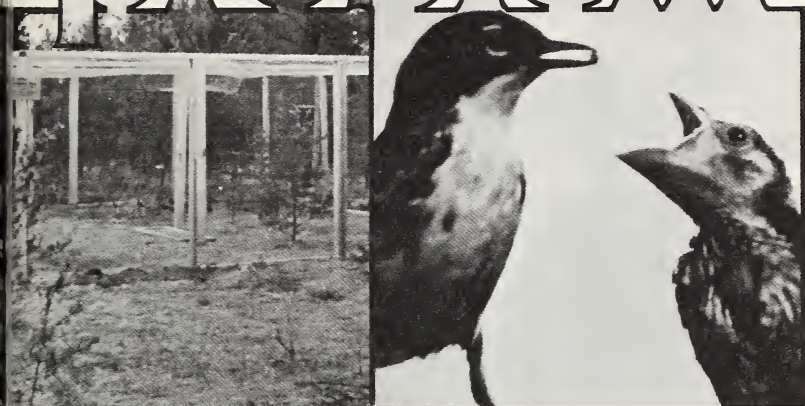
The cowbird was originally a bird of the open plains. Before the white man's arrival, forested northern Michigan was outside the cowbird's range. Thus, the Kirtland's warbler evolved without the pressure of cowbird parasitism. As land clearing and farming progressed northward in Michigan, the cowbird spread its range into the newly created habitat. It has fared well and has adapted to new conditions. In doing so, it has found new species to foster its young, including the

Kirtland's warbler. Not having innate defenses against this parasite like the species that evolved with the cowbird, the Kirtland's warbler is an extremely vulnerable host.

The cowbird eggs hatch a day or so before the warbler eggs. The cowbird hatchling is larger and more aggressive than its warbler nestmates, and will get more than its share of food brought to the nest by the adult warblers. With one cowbird in a warbler nest, one to three of the warbler chicks may survive. If two cowbird eggs are laid and hatched in a warbler nest, none of the warbler chicks will survive. Those that do hatch will soon die, since a warbler chick can not compete for food with the larger cowbird chick.

Studies of the Kirtland's warbler-cowbird relationship have shown that up to 78% of warbler eggs in parasitized nests fail to produce fledglings. Such pressure

problem



poses an intolerable burden on the Kirtland's warbler, and this is believed to have been a major factor in the recent decline in its numbers. It could, if continued unchecked, lead to the ultimate extinction of this species.

In an effort to reverse the decline of the Kirtland's warbler the Forest Service and Fish and Wildlife Service, in cooperation with the Michigan Department of Natural Resources and Michigan Audubon Society, launched a cowbird control project in 1972. During spring and early summer each year since then, cowbird traps have been operated on Kirtland's nesting areas. By 1978, 36 traps were in use. The traps are baited with sunflower seeds and water, and stocked with a few live cowbird decoys. The traps are tended daily by the Fish and Wildlife Service. Trapped cowbirds are asphyxiated while other species captured are banded and re-

leased unharmed. From 1972 through 1979, 27,921 cowbirds were removed, an annual average of 3,490.

Kirtland's warbler reproductive success has improved dramatically since cowbird trapping began. The nest parasitism rate has declined from the 1966-71 average of 65% to a 1972-79 average of 4.9%. Average clutch size has increased from 2.34 eggs per nest to more than 4. The average number of young warblers fledged per nest increased from 0.81 to 2.76 during the same period.

In spite of the increased reproductive success, the Kirtland's breeding population has only remained stable since 1972. For reasons unknown to biologists, the survival rate during migration and wintering has been low. The survival of this species is still in doubt and will require a continuing effort to provide the habitat and protection it needs. This will happen only as long as there are people who care.

the recovery plan

Rules promulgated under the Endangered Species Act of 1973 called for the establishment of Recovery Teams to assist the Fish and Wildlife Service in carrying out provisions in the Act. In early 1975, a Kirtland's Warbler Recovery Team was named by the Secretary of the Interior to guide efforts in aiding the warbler. As a result of efforts by the team, a Kirtland's Warbler Recovery Plan was prepared outlining steps designed to increase the species population. The primary objective of the plan is to "Re-establish a self-sustaining wild Kirtland's warbler population throughout its known former range at a minimum level of 1,000 pairs." Secondary objectives, designed to accomplish the primary objective, are as follows:

1. DEVELOP and maintain some 36-40,000 acres of suitable nesting habitat for the Kirtland's warbler on a sustained basis, through planned rotation cuttings on 130,000 acres of jack pine stands within designated management areas.

2. PROTECT the Kirtland's on its wintering grounds and along the migration route.
3. REDUCE key factors adversely affecting reproduction and survival of the Kirtland's warbler.
4. MONITOR breeding populations of the Kirtland's warbler to evaluate responses to management practices and environmental changes.
5. STUDY the possibility of introducing Kirtland's warblers into areas in the Upper Peninsula of Michigan or in other States or Canadian Provinces in an attempt to establish independent self-sufficient populations.

additional notes of interest



In early spring the Kirtland's warblers begin their annual trek from their winter home in the Bahamas to their nesting grounds in Michigan. Arriving a few days ahead of the females, sometime between May 3 and May 20, the males immediately establish their territories in the young jack pine stands.

When the females arrive the birds soon pair off and courtship ensues. Soon after,

the female builds her nest of leaves and grass on the ground while the male begins bringing her insects as tokens of his ardor. Virtually all warbler pairings are monogamous, but there are rare records of one male with two females in the nesting territory. Egg laying starts in late May and the first nest of five eggs is complete in five days. If, for some reason, the first nest is lost, another nest is started shortly thereafter. The male seldom shares the incubation chores, but continues to feed his incubating mate a diet of insects.



Incubation requires 13 to 16 days, and the eggs hatch sometime between June 12 and June 26. Both adults feed the young, but the female does all the brooding and most defending. The young develop rapidly and are out of the nest by the ninth day. Each parent then takes part of the brood and cares for it exclusively. The young spend the first two weeks out of the nest in the undergrowth and lower branches of the jack pines, being fed a diet of insects and blueberries after they have ripened. By the third week they be-

gin to gather most of their own food, and by the fifth week parental feeding has ceased. In some instances a pair of warblers will renest after they have reared the first brood.

In late August some of the warblers begin their return to the Bahamas, and by mid-September all have left. Little is known of the winter range requirements of this warbler. There are records of birds being observed both in the deciduous scrub and in the pine forest of these islands.

**YOU CAN HELP PROTECT THE KIRTLAND'S WARBLER AND ITS
NESTING HABITAT BY:**

1 Observe the laws and regulations.

5 Do not permit children to run and play in the area.

2 Do not camp in the area. Use nearby campgrounds.

6 Keep pets in the car and do not allow them to run.

3 Stay with the tour guides and follow their instructions.

7 Do not use recordings or imitations of Kirtland's warbler songs to attract the birds.

4 Vehicles of all types should be operated only on maintained roads within the area.

8 Unnecessary noise, movements and other disturbances have no place in this area and should be avoided.

National Forests provide a variety of uses, products, and pleasures for people. They were originally established to protect watersheds and supply timber, and they still do. But in addition, these forest lands are now rich in wildlife, forage, and recreation opportunities. These and other uses are managed by the Forest Service, U.S. Department of Agriculture. Specialists in many fields coordinate and balance uses so that all Americans will receive maximum benefits throughout the years.

State and National Forest lands
Dedicated to Kirtland's Warbler
Management:

**Michigan Department of
Natural Resources**

Management Areas within:

Au Sable State Forest

Oscoda State Forest

Ogemaw State Forest;

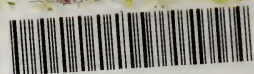
**Forest Service, U.S. Department of
Agriculture**

Management Areas within:

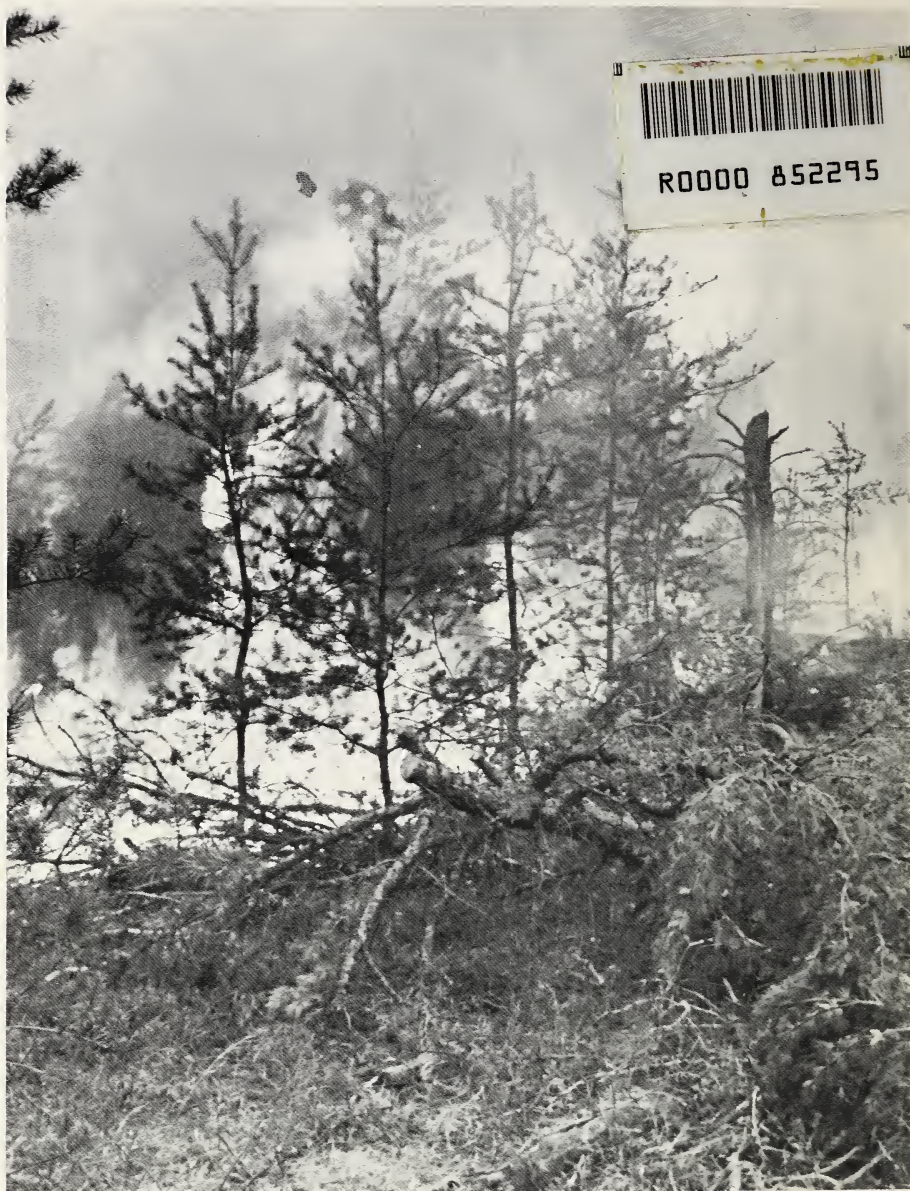
Huron National Forest



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From the ashes will rise a habitat for
a modern phoenix—the Kirtland's Warbler.

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